

CLAIMS

1. A brush device comprising a brush and a spring, the brush including a brush arm made of carbon, which is substantially arc shaped and which has a contact face that conducts electricity when in contact with a commutator, and a brush base mounted so as to rotate around a support post, the brush being mounted in a brush holder so that rotation around the support post puts a contact face in contact with the commutator, the spring impeling the brush toward the commutator,

wherein one end of the support post at a face side of the brush base is formed with a hollow cylinder and the other end is formed with a projection, the projection of the support post is fixed into the brush holder by insert molding, a guide is formed on a part of the brush base, a recess is formed in the brush holder within which one end of a winding of the coil-shaped spring is stopped by the brush base and the other end is stopped by the brush holder, the coil-shaped spring and brush are placed in substantially the same plane in such a manner that a longitudinal direction of the coil-shaped spring matches a direction of a surface of the brush holder and the winding of the coil-shaped spring follows the shape of at least one of the guide and the recess, and the one end of the support post is fixed to the surface of the brush base by spreading the hollow cylindrical end of the support post.

2. A brush device comprising a brush and a spring, the brush including a brush arm made of carbon, which is substantially arc shaped and which has a contact face that conducts electricity when in contact with a commutator, and a brush base mounted so as to rotate around a support post, the brush being mounted in a brush holder so that rotation around the support post puts a contact face in contact with the commutator, the spring impeling the brush toward the commutator,

wherein one end of the support post is formed with a hollow cylinder and the other end is formed with a projection, the projection of the support post is fixed into the brush holder by insert molding, a recess is formed in the brush holder, the brush base made of a

sheet material includes an insertion tube for insertion of the support post and a guide for accommodating the coil-shaped spring, which are integrated with the brush member as a single unit, the brush is accommodated within the recess of the brush holder by insertion of the support post into the insertion tube, one end of a winding of the coil-shaped spring is stopped by the brush base and the other end is stopped by the brush holder, the coil-shaped spring and brush are placed in substantially the same plane in such a manner that a longitudinal direction of the coil-shaped spring matches a direction of a surface of the brush holder and the winding of the coil-shaped spring follows the shape of at least one of the guide and the recess, and the one end of the support post is fixed to one end of the insertion tube by spreading the hollow cylindrical end of the support post.

3. A brush device comprising a brush and a spring, the brush including a brush arm made of carbon, which is substantially arc shaped and which has a contact face that conducts electricity when in contact with a commutator, and a brush base mounted so as to rotate around a support post, the brush being mounted in a brush holder so that rotation around the support post puts a contact face in contact with the commutator, the spring impeling the brush toward the commutator,

wherein one end of the support post is formed with a hollow cylinder and the other end is formed with a projection, the projection of the support post is fixed into the brush holder by insert molding, the spring is constituted so as to be a torsion coil spring, a recess is formed in the brush holder, the brush base is made of a sheet material and includes an insertion tube for insertion of the support post that is integrated with the brush member as a single unit, the brush is accommodated within the recess of the brush holder by insertion of the support post into the insertion tube, the torsion coil spring is fitted over an outer periphery of the insertion tube in such a manner that a longitudinal direction of the torsion coil spring is placed perpendicular to a direction of the face of the brush holder, an end of a spring wire that extends from one side of a winding of the torsion coil spring is stopped by the brush holder and another end of the spring wire that extends from the other side is stopped by the brush,

and the one end of the support post is fixed to one end of the insertion tube by spreading the hollow cylindrical end of the support post.

4. A brush device comprising a brush and a spring, the brush including a brush arm made of carbon, which is substantially arc shaped and which has a contact face that conducts electricity when in contact with a commutator, and a brush base mounted so as to rotate around a support post, the brush being mounted in a brush holder so that rotation around the support post puts a contact face in contact with the commutator, the spring impeling the brush toward the commutator,

wherein a guide is formed on a part of the brush base, a recess is formed in the brush holder within which one end of a winding of the coil-shaped spring is stopped by the brush base and the other end is stopped by the brush holder, the coil-shaped spring and brush are placed in substantially the same plane in such a manner that a longitudinal direction of the coil-shaped spring matches a direction of a surface of the brush holder and the winding of the coil-shaped spring follows the shape of at least one of the guide and the recess, and there is provided a cover plate attached so as to cover a winding of the coil-shaped spring when viewed from a direction perpendicular to the face of the brush holder.

5. A brush device comprising a brush and a spring, the brush including a brush arm made of carbon, which is substantially arc shaped and which has a contact face that conducts electricity when in contact with a commutator, and a brush base mounted so as to rotate around a support post, the brush being mounted in a brush holder so that rotation around the support post puts a contact face in contact with the commutator, the spring impeling the brush toward the commutator,

wherein a recess is formed in the brush holder, the brush base made of a sheet material includes an insertion tube for insertion of the support post and a guide for accommodating the coil-shaped spring, which are integrated with the brush member as a single unit, the brush is accommodated within the recess of the brush holder by insertion of the support post into the insertion tube, one end of a winding of the coil-shaped spring is

stopped by the brush base and the other end is stopped by the brush holder, the coil-shaped spring and brush are placed in substantially the same plane in such a manner that a longitudinal direction of the coil-shaped spring matches a direction of a surface of the brush holder and the winding of the coil-shaped spring follows the shape of at least one of the guide and the recess, and there is provided a cover plate attached so as to cover a winding of the coil-shaped spring when viewed from a direction perpendicular to the face of the brush holder.

6. A brush device comprising a brush and a spring, the brush including a brush arm made of carbon, which is substantially arc shaped and which has a contact face that conducts electricity when in contact with a commutator, and a brush base mounted so as to rotate around a support post, the brush being mounted in a brush holder so that rotation around the support post puts a contact face in contact with the commutator, the spring impeling the brush toward the commutator,

wherein one end of the support post at a face side of the brush base is formed with a hollow cylinder and the other end is formed with a projection, the projection of the support post is fixed into the brush holder by insert molding, a guide is formed on a part of the brush base, a recess is formed in the brush holder within which one end of a winding of the coil-shaped spring is stopped by the brush base and the other end is stopped by the brush holder, the coil-shaped spring and brush are placed in substantially the same plane in such a manner that a longitudinal direction of the coil-shaped spring matches a direction of a surface of the brush holder and the winding of the coil-shaped spring follows the shape of at least one of the guide and the recess, a step is formed on the support post, there is provided a cover plate attached so as to cover the winding of the coil-shaped spring when viewed from a direction perpendicular to the face of the brush holder, which is received by the step of the support post and a portion of the brush holder, and the one end of the support post is fixed to the surface of the cover plate by spreading the hollow cylindrical end of the support post.

7. A brush device comprising a brush and a spring, the brush including a brush arm

made of carbon, which is substantially arc shaped and which has a contact face that conducts electricity when in contact with a commutator, and a brush base mounted so as to rotate around a support post, the brush being mounted in a brush holder so that rotation around the support post puts a contact face in contact with the commutator, the spring impeling the brush toward the commutator,

wherein one end of the support post is formed with a hollow cylinder and the other end is formed with a projection, the projection of the support post is fixed into the brush holder by insert molding, a recess is formed in the brush holder, the brush base made of a sheet material includes an insertion tube for insertion of the support post and a guide for accommodating the coil-shaped spring, which are integrated with the brush member as a single unit, the brush is accommodated within the recess of the brush holder by insertion of the support post into the insertion tube, one end of a winding of the coil-shaped spring is stopped by the brush base and the other end is stopped by the brush holder, the coil-shaped spring and brush are placed in substantially the same plane in such a manner that a longitudinal direction of the coil-shaped spring matches a direction of a surface of the brush holder and the winding of the coil-shaped spring follows the shape of at least one of the guide and the recess, a step is formed on the support post, there is provided a cover plate attached so as to cover the winding of the coil-shaped spring when viewed from a direction perpendicular to the face of the brush holder, which is received by the step of the support post and a portion of the brush holder, and the one end of the support post is fixed to the surface of the cover plate by spreading the hollow cylindrical end of the support post.

8. A motor with a brush equipped with the brush device of any one of claims 1 through 7.